ateltek

Astronomical Time Switch
User Manual
AR-01S / AR-01D / AR-01S-NFC / AR-01D-NFC
AR-02S / AR-02D / AR-02S-NFC / AR-02D-NFC

ATEL Teknoloji ve
Savunma Sanayi A.Ş.

Rev. 2015.0.2

SAFETY WARNINGS.....1
TECHNICAL SPECIFICATIONS.....1
PROGRAM SPECIFICATIONS.....2
GENERAL.....2

DIMENSIONS.....3
CONNECTION DIAGRAM.....3
INSTALLATION.....4
DIN Rail Installation.....4
Wall Installation.....4
DISPLAY AND BUTTON DESCRIPTION.....5
DEVICE OPERATION AND FIRST SETTINGS.....6
MANUAL OPERATION.....8
MENUS.....8
Settings Menu.....9
Date Setting.....10
Time Setting.....10
City Code Setting.....11
Offset Setting.....11
Coordinates Setting.....12
Time zone Setting.....12
CET/DST setting.....13
Language Setting.....13
Program Menu.....14
Program Setting.....14
P3 and P4 Program Time setting.....15
P5 and P6 Program Time setting.....16
Display Menu.....17
Reset Menu.....17
PIN Menu.....18
Create new PIN.....17
Enter into the Menu while PIN is active.....18
PRE-SET PROGRAMS.....20
P1 Program.....20
P2 Program.....20
P3 Program.....20
P4 Program.....20
P5 Program.....21
P6 Program.....21

PROGRAM AND PARAMETER UPDATE VIA NFC SUPPORTED MOBILE DEVICE.....21

TURKEY CITY CODES.....25
FACTORY DEFAULTS.....26
REFERENCE STANDARDS.....26
BATTERY REPLACEMENT.....27

⚠ SAFETY WARNINGS

- The device must be installed and activated by qualified personnel, following the connection diagram provided in this manual.
- The electricity should be cut down before the installation of the device.
- Don't open the case of the device.
- The electricity should be cut down before battery replacement.
- Install the device into a place safeguarded from outdoor.
- Use only dry cloth for cleaning the device.
- Contact only with the qualified technical service regarding the troubles of the device.
- The manufacturer is not responsible in case of damages under failure to follow the above safety warnings.

WARNING:
The device is out of warranty when warranty sticker is removed.

TECHNICAL SPECIFICATIONS

Power Supply	230 V_{AC} ±10% 50/60 Hz
Relay Output	**16A/4000VA x 1 adet (AR-01S&AR-01S-NFC)**
	16A/4000VA x 2 adet (AR-01D&AR-01D-NFC)
	10A/2500VA x 1 adet (AR-02S&AR-02S-NFC)
	10A/2500VA x 2 adet (AR-02D&AR-02D-NFC)
Additional Reserve	9~12 hours
Battery / Battery Life	CR2032 / 5 years
Renewal	1 sec
Display Size	1,45 '' LCD
Dimension	2 DIN
Time Precision	≤ 1 sec/Day
Sunset and Sunrise Accuracy	≤ 1 min
Operating Temperature	-20ºC / 60ºC
Storage Temperature	-30ºC / 60ºC
Installation	DIN Rail or Wall mounting
Protection Class	IP20 (terminals) / IP41 (front panel)
Other Specifications	Battery Replacement
	Sealable Button Cover
	Backlit LCD Display
	Parameter Update with NFC (*)

(*) only in NFC models

PROGRAM SPECIFICATIONS

- Turkish and English Menu.
- Each contact can be programmed separately.
- Each program can be assigned to different days separately.
- Automatic or manual CET/DST selection.
- Offset feature selection for sunrise and sunset up to ±9:59 (hh:mm)
- Time zone selection with a ± 30 minute interval up to ±14 hours.
- Built-in 81 city codes selection option or coordinate selection as latitude and longitude.
- Manual operation option.
- Automatic operation in next sunset or sunrise even if its forgotten on manual operation
- All configurations can be reset with reset menu.
- All configurations can be viewed on display via short cut key.
- Pin option to block off unqualified persons usage.

GENERAL

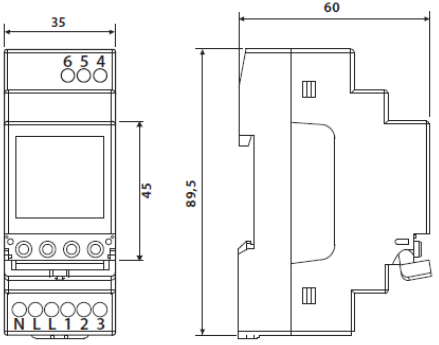
AR-xxS/AR-xxS and AR-xxD/AR-xxD models are programmable switch to turn on electric utilities between sunset and sunrise accordingly to the coordinates automatically for the built-in coordinates of the city codes or manually configured coordinates for the assigned programs to the contacts.

In AR-xxS-NFC and AR-xxD-NFC models, Settings and Program menus can be updated quickly via NFC (Near Field Communication) supported mobile device.

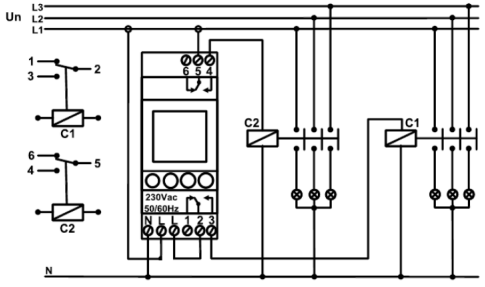
Usable for Street, road, field lighting, parks, garden illumination, parking, luminous signboards and other illumination applications.

WARNING:
If the device is not connected to electricity, it goes into sleep mode in 20 minutes if there is no action on any button. In this mode the display is off. It will continue to operate when pushing on any button.

DIMENSIONS



CONNECTION DIAGRAM

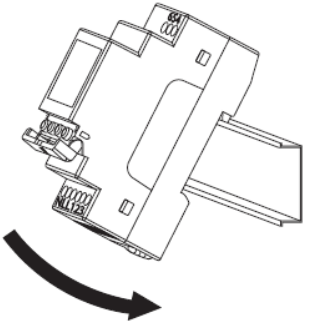


NOTE:
AR-xxD and AR-xxD-NFC, includes C1 and C2 contacts
AR-xxS and AR-xxS-NFC, includes only C1 contact

INSTALLATION

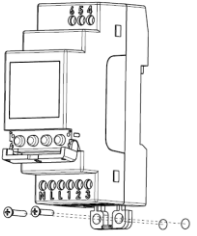
The device can be mounted on DIN rail or wall.

DIN Rail Installation



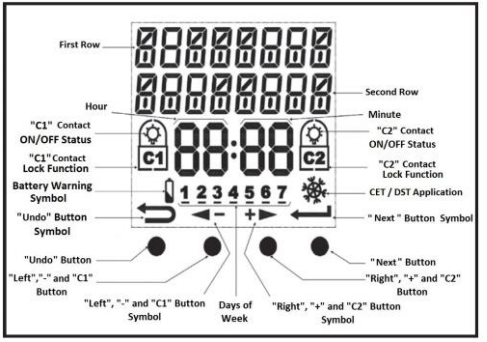
Place the grave accent to the DIN rail. Then place the bottom case with pushing hand.

Wall Installation



Move the lock mechanism one level down with screw driver. After that the wall installation can done with screw seen on the figure.

DISPLAY AND BUTTON DESCRIPTION



☼	Shows the on - off status of the concerning contact.
🔒	Lock symbol. Disables to use the manual operation. To remove this symbol, push on for 5 sec. to the “right” or “left” button.

C1 C2	The contact symbols within the lock symbol. Shows the concerning contact.
🔋	Battery status symbol. Blinks when the battery life fall down to critical level.
------?	The symbol which shows the days of the week.
⮌	**General Usage;** “undo” button symbol. Used to go to previous progress or escape. **Special Usage:** One time push in Main Menu brings City Code-Sunrise-Sunset information to the display. Pushing for 5 sec. to “undo” button on Main Menu brings the Tracing Menu and all configurations are shown as slide.
◄	“left” button symbol. Used for go to the previous Menu.
►	“right” button symbol. Used for go to the next Menu.
–	“-“(minus) button symbol. Used for decrease the value while making settings in the Menu.
+	“+” (plus) button symbol. Used for increase the value while making settings in the Menu

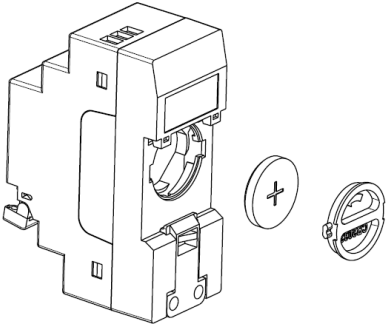
	“Next” button symbol. Used for entry into a Menu or confirm value/activation while making settings.
	CET/DST symbol. Active if CET/DST Mode is active. The symbol is in OFF mode when CET/ DST mode is inactive.
	Second symbol. Blinking in main menu one in a second.

DEVICE OPERATION AND FIRST SETTINGS

WARNING:
The electricity should be cut down before the installation of the device. Remove the electrical cables if connected.

Apply the following steps:

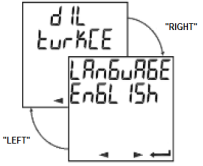
- Remove the battery from its package and insert it in the housing on the rear of the device, so that the (+) pole is on the top as shown in the figure. Then secure the cover, turning it clockwise.



NOTE:

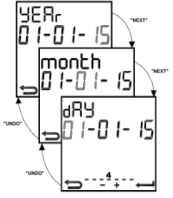
When battery is placed, all symbols are ON for 2 second and the Date-Time-City Code settings can done respectively. The values can change via “+”, “-“ buttons, confirm with “Next” Button and correct with “undo” button.

- Language setting



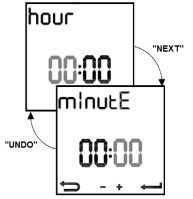
Language menu

- Date setting (preset)



Date menu

- Time setting (preset)



Time menu

- City Code setting (preset)

City code menu

After these settings the main menu can be open. For the other settings use the menu chapter.

MANUAL OPERATION:

To operate the contacts manually push for 5 sec to the concerning contact (C1 or C2) and the lock symbol will be off on the display in the concerning contact and manual operation is activated. Pushing 1 sec to the concerning contact button will change the contacts to the other one. To activate the automatic mode it is necessary to push for 5 sec to the concerning contact button again.

NOTE:
The device will continue to operate in automatic mode in next sunset or sunrise time, even if it will let into manual mode or forgotten on manual mode.

MENUS

Settings

It is necessary to push “next” button in main menu to reach to this menu. Used to adjust Date, Time, City Code, Offset, coordinate, time zone and CET/DST settings.

Program

This menu can reached with pushing on first “next” button in main menu and with “right” or “left” button. The concerning program can be signed on the concerning contact.

Display

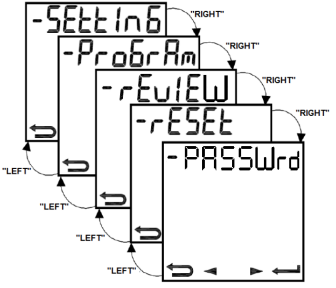
This menu can used with pushing “next” button in main menu with “right” or “left” buttons. It is used for see all settings.

Reset

This menu can used with pushing “next” button in main menu with “right” or “left” buttons. It is used to return back to factory defaults.

PIN

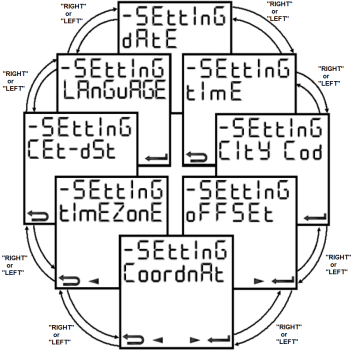
This menu can used with pushing “next” button in main menu with “right” or “left” buttons. It is used to define pin or activate or inactivate pin.



Menus

WARNING:
If waiting without pushing on any button in the Menus, the device go into main menu. To don’t make any settings in the Menu, don’t push to any button for 20 sec.

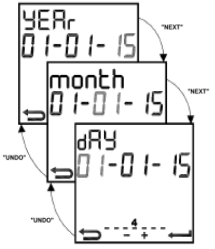
Settings Menu



Settings menu

Date setting

It is used for setting a new date value.



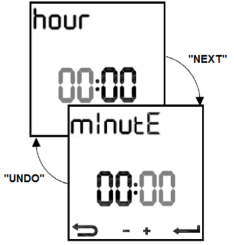
Date setting menu

Year, Month, Date values are changed with “+”, “-“ buttons.

New value can be confirmed with “next” button, and previous value can be reached with “undo” button.

Time setting

It is used for setting a new time value.



Time setting menu

Hour and minute values are changed with “+”, “-“ buttons.

New value can be confirmed with “next” button, and previous value can be reached with “undo” button.

City Code setting

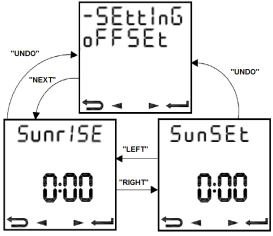
It is used for setting a city code value.

City code setting menu

City Code value is changed with “+”, “-“ buttons and confirmed with “next” button.

Offset setting

This menu is used for defining the offset time value as putting forward or falling back the sunset and sunrise time.



Offset setting menu

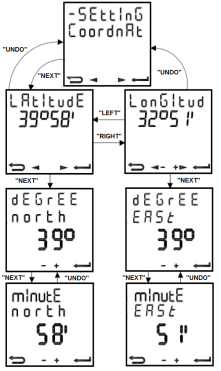
The sunset and sunrise offset time can be setting up to ± 9 hours 59 minute and confirmed with “next” button.

NOTE:

Sunset offset time can be set up to 23.59, sunset offset time can be set up to 00.00. Offset time is limited with the same calendar day. That means sunset offset don’t operate in previous day and sunrise offset don’t operate in next day.

Coordinates setting

This menu is used for setting for longitude and latitude.



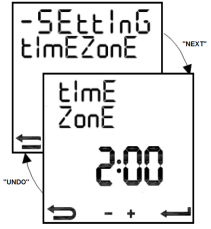
Coordinate setting menu

Latitude and longitude values are changed with “+”, “-“ buttons and confirmed with “next” button.

NOTE: Changing the coordinate values will not change the city code, it will be as previous value. To use the concerning coordinates accordingly to the city, it is necessary to change again the city code and the concerning coordinates will be loaded again.

Time Zone setting

This menu is used for setting the time zone in which the device will be used.

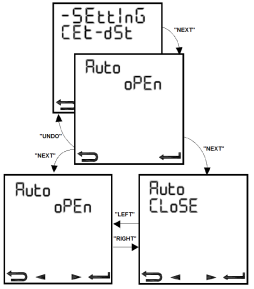


Time zone setting menu

Time zone can be select with 30 minutes interval with “+”, “-“ buttons and confirmed with “next” button.

CET/DST (Central European Time/Daylight Saving Time) setting

This menu is used for open/close CET/DST application.

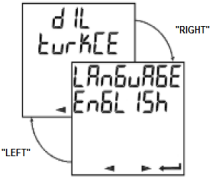


CET / DST Menu

CET/DST can be open with “right”, “left“ buttons and confirmed with “next” button.

Language Setting

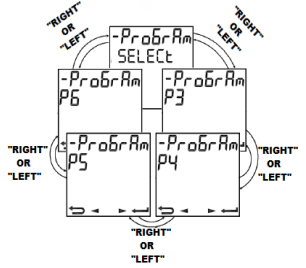
This menu is used for select language.



Language Menu

The selection may be done with “right”, “left“ buttons and confirmed with “next” button.

Program Menu

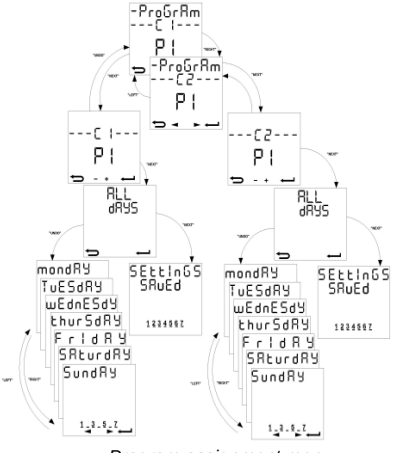


Program Menu

Program setting

This menu is used to assign the preset program to the concerning contact and to select the specific days in the week.

(See page 20 for P1, P2, P3, P4, P5 and P6 programs)



Program assignment menu

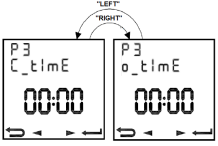
To assign the program for all days in the week, select “all days” and push “next” button for confirmation.

To select a specific day/days push “undo” button and go to the concerning day with “right” and “left”, push on “next” button to activate/inactivate the day. After selection the days it is necessary to push for 5 second to the “next” button for confirmation. All settings can be controlled with Display Menu

NOTE:
The assigned program is operated between the sunset of assigned day and sunrise of next day.

Time Setting of P3 Program

This menu is used for setting the close/open time of P3 program.



P3 program menu

P3 C_TIME; it is the closing time of the contact after sunset in P3 program.

P3 o_TIME; it is the opening time of the contact after P3 C_TIME.

Time Setting of P4 Program

This menu is used for setting the closing time of P4 program.

P4 program menu

P4 C_TIME; it is the closing time of the contact after sunset in P4 program.

Time Setting of P5 Program

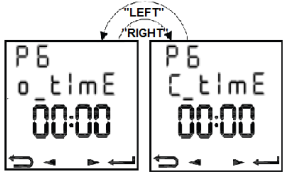
This menu is used to set the opening time of P5 program.

P5 program menu

P5 o _TIME; it is the opening time of the contact after sunset in P5 program.

Time Setting of P6 Program

This menu is used for setting the open/close time of P6 program



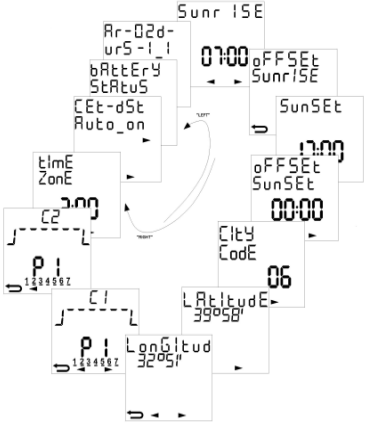
P6 program menu

P6 o_TIME; it is the opening time of the contact after sunset in P6 program.

P6 C_TIME; it is the closing time of the contact after P6 o_TIME.

Display Menu

All settings can be traced in this menu. In this menu the settings couldn't be changed.



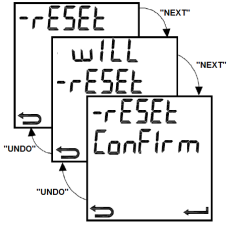
Display menu

It is possible to review the settings with "right", "left" buttons and exit with "undo" button.

NOTE:

This menu can be used also with pushing for 5 sec to the "undo" button in main menu.

Reset Menu



Reset menu

This menu is used to bring the device into factory defaults. To reset the device push "next" button to "will reset" and "reset confirm" warnings in menu and reset will be confirmed. After reset the device, all symbols will be on for 2 sec and the device will continue to operate after setting date, time and city code.

PIN Menu

This menu is used to enable block off the menu for unqualified persons.

NOTE:

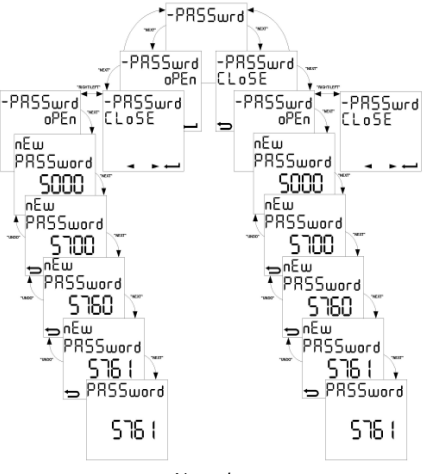
The pin application is closed in first setting. It may be activated from the menu.

WARNING:

After activation of the pin menu, it will be impossible to use the pin for entering into the menus. Contact with the qualified technical person if the pin is forgotten.

New pin creating

Sample: To create pin 5761, push on “next” button in main menu and go to pin menu via pushing “right” or “left” buttons. To enter to this menu push “next” button. Select “pin open” with “right” or “left” buttons. New pin will be appear on the menu. Enter new pin and confirm. The new pin will be activated and used to enter into the menus.



New pin menu

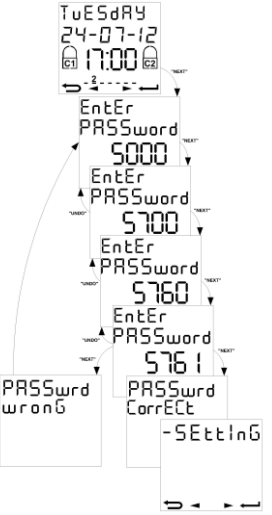
Enter into the menu while pin is active

To enter into a menu while pin is active, it is necessary to enter the pin. If enter a wrong pin, pin wrong warning will be appear on menu. The menu input can be done after entering the correct pin.

Pin input will be necessary for each input into the menu. If you need long time for setting the device, disable pin and enable it after finishing all settings.

WARNING:

The pin is passive in default settings. Therefore when reset the device the pin will be inactive even if it was activated before reset.



Pin Menu

PRE-SET PROGRAMS

The device is equipped with 4 pre-set programs that allows the user to program the device. These are P1, P2, P3, P4, P5 and P6 programs.

P1 Program

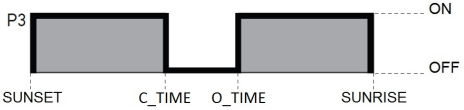
P1 Program is operating accordingly to astronomical time zone. The concerning contact is active in the sunset and passive in the sunrise.

P2 Program

In P2 program the concerning contact is passive all day.

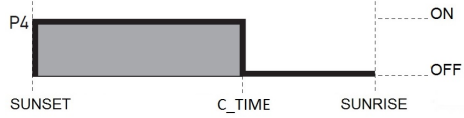
P3 Program

In P3 Program, the concerning contact is deactivated in the defined duration between sunset and sunrise. This time can be set from P3 menu.



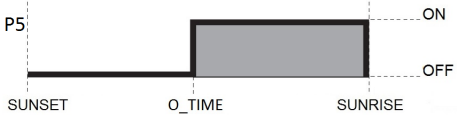
P4 Program

P4 Program brings the concerning contact after the sunset passive according to the concerning time. This time can be set from P4 menu.



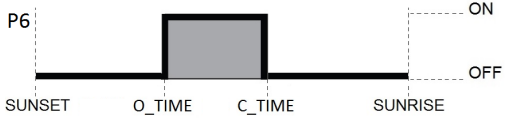
P5 Program

P5 Program is the reverse of P4 program. P5 Program brings the concerning contact active after sunset according to the defined time until sunrise. This time can be set from P5 menu.

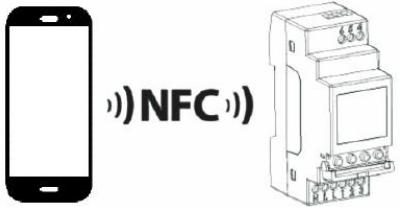


P6 Program

P6 Program is the reverse of P3 Program. The concerning contact is activated in the defined duration between sunset and sunrise. This time can be set from P6 menu.



PROGRAM AND PARAMETER UPDATE VIA NFC SUPPORTED MOBILE DEVICE



The setting and Program menu of the device can be updated via NFC (Near Field Communication) supported mobile device.

All you need is to download the “ASTROID ateltek” application to the mobile device. All settings in the setting menu and program menu can be updated via mobile device.

With this application it is possible to get the coordinates, Time and Date information via GPS signals accordingly to UTC (Coordinated Universal Time) and update the Astronomical Time Switch.

It is possible to make the update in the following ways:

- While the device is closed
- Update while first settings
- Update in the Main Menu

Update while the device is closed

It is possible to make update via mobile device while the device is closed. The device will operate accordingly to the setting time.

If the settings of Date, Time and City Code or Coordinates are done, the first setting menu will skip and operation will continue with normal menu.

Note: The Date and Time informations should be updated in first operation.

Update while first settings

While first setting, all settings and program menu settings can be done with mobile device.

The first settings (Date,Time and city code (or coordinate)) can be done via mobile device and the device can be operate with main menu.

Update in the main menu

While operating, all parameters in the setting and program menu can be updated.

Note: While update during operation, the device menu should be open each time before NFC update.

Update via NFC:

Download and install the "**ASTROID ateltek**" application from Google Play Store with the Android mobile device.

- **Language Selection:**

After opening the “ASTROID ateltek” application, you can select the language in first menu and continue to make all settings with the selected language.

After selecting the language, all settings will be open in a new menu.

- **Location Selection:**

Location can be set automatically or manually.

Automatic:

After language selection, the application will find the coordinates automatically via GPS signals. The latitude and longitude values will be fixed after GPS signals are fixed.

Note : The application will request to open NFC and GPS features if closed.

Manual:

After language selection, if location setting is selected as manual, Longitude and latitude can be set manually.

After language selection, if location setting is selected as manual, Longitude and latitude can be set manually. Meantime checking the “set” box will enable to select the city codes from the list and the coordinates can be set automatically to the concerning city.

- **Time Setting:**

Time setting can be set as automatically or manually.

Automatic:
In automatic mode the date and time data will be set automatically via GPS signals according to UTC (Coordinated Universal Time).

Manual:
In manual mode, Date and time can be set manually.

- **Other Settings:**

All settings in the setting menu can be set from this area.

CET/DST:
CET/DST application can be open and closed.

Offset Sunrise:
Sunrise offset can be set from this area.

Offset Sunset:
Sunset offset can be set from this area.

Time zone:
Time zone can be set from this area.

- **Program Update:**

C1 and C2 program update can be set from this area.
The time setting can be set manually according to the concerning Program.

- **Parameter Update:**

After setting all necessary parameters on mobile device, it is necessary to approach to the NFC antenna of the device (Astronomical Time Switch) with the mobile device and push to WRITE to start the update. A message will appear on the mobile device when the update process will result successful. After that the mobile device should be removed from the Astronomical Time Switch. Don't approach the mobile device to the Time Switch until the update will done.

- *If the device is closed while update, it will start to operate with the parameters while first settings.*

- *If the device is updated while first operation and Date, Time and City code (or coordinates) are set via NFC application, the first setting menu will be skipped.*

- *If the device is updated in normal operation, necessary parameters will be updated and the device will continue in normal operation.*

TURKEY CITY CODES

1	Adana	15	Burdur	29	Gumushane
2	Adiyaman	16	Bursa	30	Hakkari
3	Afyon	17	Canakkale	31	Hatay
4	Agri	18	Cankiri	32	Isparta
5	Amasya	19	Corum	33	Icel
6	Ankara	20	Denizli	34	Istanbul
7	Antalya	21	Diyarbakir	35	Izmir
8	Artvin	22	Edirne	36	Kars
9	Aydin	23	Elazig	37	Kastamonu
10	Balikesir	24	Erzincan	38	Kayseri
11	Bilecik	25	Erzurum	39	Kirklareli
12	Bingol	26	Eskisehir	40	Kirsehir
13	Bitlis	27	Gaziantep	41	Kocaeli
14	Bolu	28	Giresun	42	Konya

43	Kutahya	57	Sinop	71	Kirikkale
44	Malatya	58	Sivas	72	Batman
45	Manisa	59	Tekirdag	73	Sirnak
46	K.Maras	60	Tokat	74	Bartin
47	Mardin	61	Trabzon	75	Ardahan
48	Mugla	62	Tunceli	76	Igdir
49	Mus	63	Sanlıurfa	77	Yalova
50	Nevsehir	64	Usak	78	Karabuk
51	Nigde	65	Van	79	Kilis
52	Ordu	66	Yozgat	80	Osmaniye
53	Rize	67	Zonguldak	81	Duzce
54	Sakarya	68	Aksaray		
55	Samsun	69	Bayburt		
56	Siirt	70	Karaman		

FACTORY DEFAULTS

Offset Sunrise	0:00
Offset Sunset	0:00
Time Zone	+2:00 GMT
C_TIME (P3)	00:00
O_TIME (P3)	00:00
C_TIME (P4)	00:00
C_TIME (P5)	00:00
O_TIME (P6)	00:00
C_TIME (P6)	00:00
Assigned Program to C1	P1
Assigned Program to C2	P1
CET/DST Application	OPEN
PIN	CLOSED

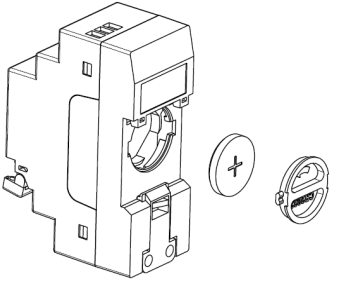
REFERENCE STANDARTS

The device is designed under the following directives and is reported with the tests in accredited laboratories.

- **2004/108/EC** Electromagnetic Compatibility (E.M.C.)
    - **EN 60730-1** General Requirements
    - **EN 60730-2-7** Automatic electrical controls for household and similar use
- **2006/95/EC** Low Voltage Directive (LVD)
    - **EN 60068-2-1** Environmental testing; Cold
    - **EN 60068-2-2** Environmental testing; Dry heat
    - **EN 60730-2-7** Automatic electrical controls for household and similar use
- **DIN 43 880** Built-in equipment for electrical installations
- **EN 62054–21** Particular requirements for time switches (Crystal controlled time switch test)

BATTERY REPLACEMENT

- The battery symbol is blinking when the battery life fall below the critical level. The battery should replace when this alert observed.
- To replace the battery; disconnect the power supply
- Remove the cover from the battery compartment, turning it anticlockwise, replace the battery and replace the cover, turning it clockwise. The “+” pole of the battery should be on the top.
- Use CR2032 battery only.



NOTE:

The device can operate under power failure together with additional reserve, even of low battery voltage.

Throw away the run down batteries in compliance with current regulations on the disposal of harmful waste.

ATEL Teknoloji ve Savunma Sanayi A.S. / ATEL Technology and Defense Industry Inc. Co.
Hilal Mah. 677. Cad. No:9
Yildiz - Cankaya - Ankara / Turkey
t : +90 312 441 42 20
f : +90 312 441 42 18
www.ateltek.com / atel@ateltek.com
www.astronomikrole.com / atel@astronomikrole.com

Ateltek is a brand of ATEL Technology and Defense Industry Inc. Co.